Base Load Power Hub (BLPH)

MATERIAL DATA BOOK (MDB) Index

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1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.1.1 Project Location

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

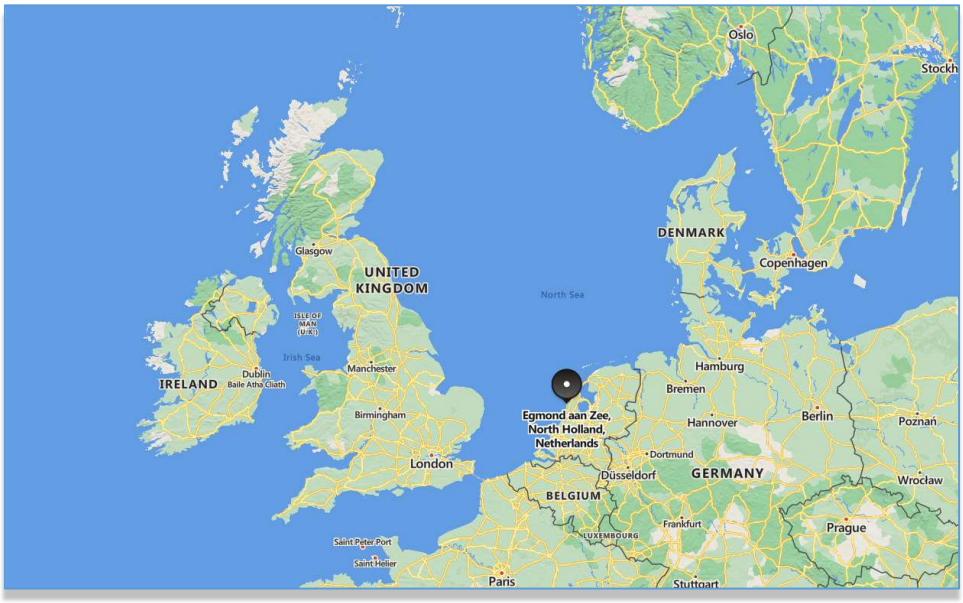


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map

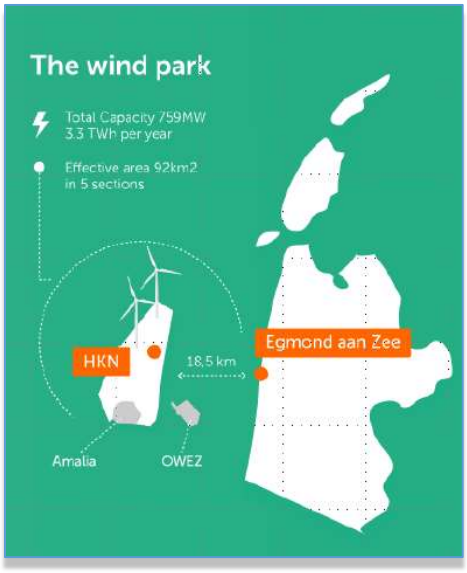


Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.1.2 Project Concept

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

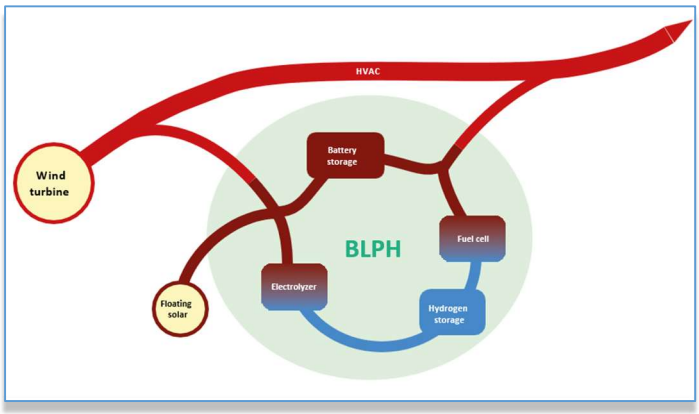


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

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2 DOCUMENT SCOPE

This document was created as a guideline in organizing the MRB in a structured and coherent way. It offers a framework for the preparation process, ensuring everyone the necessary criteria are met precisely.
This procedure applies to the supply of base load materials and equipment
Power Hub (BLPH) project for Crosswind. Outlines the steps and requirements needed for creation and submission of the Material Data Book (MDB) to ensure compliance with project specifications and quality standards.
This procedure does not apply to bulk supplies for which only material certificates are required.

2.1 REFERENCES

Doc. No.	Description
23A90-PML-QHSE-QP-00002	PROJECT QUALITY PLAN

Table 1 - Reference Documents

2.2 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project
VENDOR OR SUPPLIER	Any organization employed by Rosetti Marino to supply either products or services
MDB	Material Data Book

Table 2 - Definitions and Abbreviations

3 MANUFACTURING DATA RECORD INDEX

3.1 PART 1 – DESIGN DOSSIER

This section includes an in-depth collection of all design data, drawings and "As Built" documents.

documents.The documents are divided into subcategories as follows.

The documents listed below serve as examples and do not constitute a comprehensive list of requirements:

- List:
  - Documents register
  - Cables List
  - Load List
  - Electrical components List and DS
  - HVAC Components List and DS
  - HVAC IO List

- Diagrams
  - Structural Calculation
  - Interconnecting Wiring Diagrams
  - General Arrangement
  - Computer Systems Architectural Diagrams.

- Drawings :

  - General arrangement drawings
  - Foundation Drawing
  - Detailed drawings
  - HVAC and Lighting Panel Wiring Drawing and General Arrangement (Incl. Interconnecting)
  - Detail shop drawings (excluding detailed machining drawings).

- Project Procedures and Specification :

  - Project Management –
  - Engineering –
  - Procurement/Supply
  - Construction
  - Manufacturing and Testing procedures
  - Installation -Transportation
  - Commissioning Procedure
  - HVAC Syst Description (Management Logics)
  - Start-Up

- Piping Classes :

- Calculation Notes :

  - HVAC Calculation Report (incl. HVAC SYS Clc and Heat Dissipation Calc)
  - PID

- Equipment requisitions :
- Data Sheets :

3.2 PART 2 – CERTIFICATION DOSSIER

This section encompasses a thorough compilation of all Quality Records documents

It contains all evidence certifying that the required quality level has been attained (e.g., all Certifying Authority Reports/Certificates).
The documents are to be organized by "discipline section" as outlined in Part 1.
Documents should be sub-categorized as follows.
The documents listed below serve as examples and do not constitute a comprehensive list of requirements

- Acceptance :

  - Derogations and queries registers with signed copies
  - Internal and External Inspection certificates/reports (Vendors)
  - Conformity with technical specification certificates
  - Acceptance qualifications list (equipment/construction)
  - Documents confirming

- Manufacturing and testing Recor :

  - Authorities and Third parties' acceptance and release certificates/reports
  - Materials certificates (including consumables, such as electrodes and paint)
  - Warranty Surveyor's certificates.
  - Quality Control plan /Inspection & test Plan / Inspection Reports
  - Marking drawings and associated traceability
  - Non-Destructive Testing certificates/reports
  - Non-Destructive Testing procedure
  - Dimensional control certificates/reports
  - Painting certificates
  - NCR's and Waivers reports
  - Welding and preheating book/procedures
  - Painting procedures
  - Compliance with CE Marking, ATEX, and PED requirements as relevant to the scope of supply.
  - Relevant equipment Design IRCs (where applicable)
  - Pressure & Function Test Reports
  - FAT Procedure

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- Test Record :

- Test records included any qualification testing that has been performed when applicable.
- Production test result records.
- Mechanical Completion records
- FAT reports

4 DESIGN DOSSIER

4.1.1 LIST

Contractor Document Number	Title	Notes

4.1.2 DIAGRAMS

Contractor Document Number	Title	Notes

4.1.3 DRAWINGS

Contractor Document Number	Title	Notes

4.1.4 PROJECT PROCEDURE AND SPECIFICATION

Contractor Document Number	Title	Notes

4.1.5 PIPING CLASSES

Contractor Document Number	Title	Notes

4.1.6 CALCULATION NOTES

Contractor Document Number	Title	Notes

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4.1.7 EQUIPMENT REQUISITIONS

Contractor Document Number	Title	Notes

4.1.8 DATA SHEETS

Contractor Document Number	Title	Notes

5 CERTIFICATION DOSSIER

5.1.1 ACCEPTANCE

Contractor Document Number	Title	Notes

5.1.2 MANUFACTURING AND TESTING RECORD

Contractor Document Number	Title	Notes

5.1.3 TEST RECORD

Contractor Document Number	Title	Notes